

Ningaloo

WAMSI Node 3

Reef-slope and lagoon fish communities in the Ningaloo Marine Park

Carnivorous and herbivorous reef-slope and lagoon fish communities were surveyed in 2006 and 2007, inside and outside of sanctuary zones within Ningaloo Marine Park, to provide a benchmark for current and future assessments of the effectiveness of sanctuary zones in providing protection for these species.

Background

Ningaloo Marine Park is a multiple-use marine protected area (MPA) with several different types of management zones, including both recreation and sanctuary zones.

The primary purpose of sanctuary zones in Western Australian MPAs is to conserve marine biodiversity in a relatively undisturbed environment free of destructive human activities. Secondary purposes are as 'natural' study areas for non-destructive research, as reference areas to assess the impacts of human use in other parts of the MPA, and for passive recreational and commercial uses and as refuges (or sanctuaries) to assist the management and recovery of exploited populations. As such, commercial and recreational fishing are prohibited in the sanctuary zones of the Ningaloo Marine Park.

Carnivorous fish species, commonly targeted by recreational fishers in the lagoon and reef areas of Ningaloo Marine



Park, were surveyed in 2006 and 2007 to assess whether populations in original sanctuary zones (established in 1991) differed from those in areas that were open to fishing. Important herbivorous (plant-eating) fish families were also surveyed. These species are not generally targeted by fishers, but play an important role in the ecology of the coral reef ecosystem of Ningaloo Marine Park.

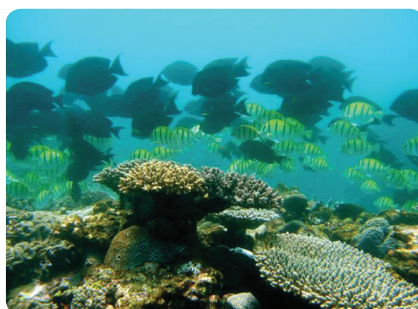
The work also aimed to provide baseline data on populations from newly declared sanctuary zones (established in 2005) that could be used to assess future trends in protected populations as well as across the marine park as a whole.



Survey findings

Over 400 sites were surveyed using underwater visual census, in and around 12 sanctuary zones distributed along the length of the park. The surveys found:

- fish communities differed by habitat and region (e.g. from north to south) within the park
- differences were also found between fish communities inside and outside sanctuary zones
- overall, there were more and/or larger fish of prized target species for recreational fishers (Emperors), inside sanctuary zones, which provides evidence that the sanctuary zones at Ningaloo Marine Park are effective in their role to protect and/or allow the recovery of species impacted by human activity (i.e. fishing)
- there were also clear trends relating to fishing pressure among many species found on the reef slope, including large groupers (e.g. cod) and sharks, i.e. there were less and/or smaller fish in areas with higher levels of recreational fishing pressure
- some species commonly targeted by recreational fishers were significantly more common outside sanctuary zones than inside them. While the reasons for this are unclear and likely to be complex, most of these species are strongly associated with reef slope habitats on the outer side of the reef, a habitat which has only recently been adequately protected through the sanctuary zones established in 2005.



Outcomes

This study has delivered a reliable estimate of fish populations and community composition along the entire extent of the marine park which has allowed an examination of the effects of fishing throughout the park as well as within individual regions.

The findings of this project provide some assurance that the sanctuary zones within the marine park are working as intended. However, this will require ongoing monitoring as the newer sanctuary zones have not been in place long enough to detect any changes in fish populations.

The data and sampling protocols provide the basis for the design of an ongoing monitoring and research program which could offer greater economy and precision, and provide the most accurate possible estimates of how many fish are present on the reef.

The findings enable management to gauge the status of targeted species of fish in Ningaloo Marine Park, and to take appropriate steps to modify management actions if necessary to ensure the ongoing health of marine ecosystems in the Park.



Contact

Dr Russ Babcock
CSIRO Wealth from Oceans Flagship
Phone: +61 8 9333 6535
or +61 7 3833 5904
Email: russ.babcock@csiro.au



western australian
marine science institution

National Research
FLAGSHIPS
Wealth from Oceans



Department of
Environment and
Conservation
Our environment, our future



THE UNIVERSITY OF
WESTERN AUSTRALIA
Achieving International Excellence

Ningaloo research is an initiative of the Western Australian Marine Science Institution, CSIRO's Ningaloo Collaboration Cluster and the Australian Institute of Marine Science, working in partnership with government, local communities and enterprises.